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Original Communications

RESECTION AND REPRODUCTION OF THE MAXILLÆ.*

By G. LENOX CURTIS, M.D., NEW YORK.

Formerly Professor of Oral and Facial Surgery, New York Dental School and Instructor
in the New York Post Graduate Medical School and Hospital.

The purpose of this paper is to show the profession the importance of special study and instruction in oral and facial diseases, and that these are worthy of the same consideration as is given to any of the fully recognized specialities in medicine. Until they do appear in the curriculum of the medical school, the faculty will not have done its duty toward the student. The field covered by the general surgeon is altogether too great for a careful consideration of any part where such minuteness is required to save and assist nature in doing her work. The surgeon most capable of successful teaching in this line, is he who has been a thorough and conservative dentist.

Like produces like ; this applies to every department in nature. The periosteum, under favorable conditions, will reproduce the substance it covered. That of the ramus of the jaw will only make the thin lamina of bone which nature has originally placed there, while that of the malar and the body of the jaw reproduces a dense structure differing materially in texture.

If the function of a part be permanently lost, reproduction is not a necessity, nature supplying only that part which is required. If

* Read before the American Medical Association at Philadelphia, June, 1897.

the teeth have been extracted with a view to remaining out, the portion of the jaw which is required to nourish them is not reproduced, but where the teeth are replaced and retained, all, or sufficient, of the bone is reproduced and reattaches them to the jaw. Such I have seen in active use for years.

The only condition I can ascribe for the removal of the periosteum is where it is attacked by disease, such as cancer, and the entire structure destroyed. When the bone alone is destroyed, as in necrosis, cystic tumors, or from pressure by resistance of a growth, as tumor of the antrum, I see not the slightest necessity for removing this natural sheath, but on the contrary every reason for retaining it. I have seen Billroth, Von Borgmann, Agnew, Ashhurst, Garretson, and other great surgeons resect the jaw, but they invariably employed Huyfelder's, Fergusson's or Landenbeck's method, except in necrosis where but small sections were involved. Liston, Tait, Barton, Mütter and Cross also followed on these lines. But what can we say for the subject? Partially or wholly jawless, maimed and disfigured for life, a repulsive and pitiable object to others and a shrinking annoyance to himself. Is it not time to call a halt and look this matter squarely in the face?

I do not censure the surgeon whose opportunities to acquire knowledge have been dwarfed by the oversight of his teachers.

My method to obtain the best results in the preservation of the contour of the jaw, is by retaining the necrosed bone in position until the periosteum has been so strengthened by the reproduction as to allow nature's outlines to be maintained, employing it as an inter-osseous splint. Where it is necessary to remove the bone, I retain the contour of the face by gauze packing and change from time to time until the bone is sufficiently reproduced to resume its shape. This requires frequent dressing so that the amount of pus may be kept at the minimum. The teeth are retained in position by means of inter-dental splints or ligatures. Where the teeth are lost, I place other teeth in the opening when the wound is nearly closed, maintaining them by artificial support and allowing the bone to form around them. Where the destruction of the bone has been great and the periosteum too weak to retain the jaw in position during the process of reproduction, I use an inter-dental splint (as employed by Liston over fifty years ago) in which the upper and lower teeth properly occlude. By hastening slowly, the danger of wounding the dental nerve is materially lessened.

I was once asked to assist a general surgeon to remove one-half of the inferior maxilla, he claiming it to be Sarcomotis. I saw nothing but an enlargement of the sub-maxillary gland due to the septic influence of a tooth-pulp. I labored with him to save the man's jaw and show the error he was falling into. He defiantly replied, "I have said that it is a cancer of the jaw and must be taken out,

and I am going to do it." And so indeed he did, thus maintaining his wisdom with the patient.

The bone he removed was as perfect as nature made it. This is but one of the many terrible examples of what results from retaining old methods.

Scarce can we read a text-book in which is not found methods on treatment of facial diseases in vogue half a century ago.

In 1886 I operated on a young woman, aged 23, with the following history. Four years previous, after suffering much pain in the face, which was swollen, a fistula appeared in the lower jaw which was diagnosed as being from an abscessed tooth. The gums around the tooth were swollen and inflamed, the molars and second bicuspid were extracted and pus continued to flow. Her health rapidly diminished, menses ceased, and had not returned although constantly under medical and surgical treatment.

Examination revealed the emaciated condition of the patient. She was suffering from blood poisoning, was highly nervous and hysterical, had no desire for food and had lost the sympathy of her doctors and family. In the left inferior maxilla where the tooth had been extracted, there were granulations. A boggy condition of the mucous membrane extended all along that side of the jaw. Over the ramus it was particularly inflamed. The probe readily passed beneath the periosteum and far up along the ramus. The patient was then too sick for an operation with a view to best results. The wound was cleansed daily to lessen the amount of pus, and for one month the patient was placed under most rigid restorative treatment with good results. I found that under the local stimulating treatment, bone had been sufficiently reproduced to strengthen the periosteum so that when I removed the dead jaw the contour was preserved. The cause of the trouble I found to be a wisdom tooth lying transversely at the neck of the jaw immediately under the condyle. This along with the granulations and debris was removed. The wound was packed continually until healthy granulations filled in the periosteum; the jaw, minus the teeth, was reproduced with all its usefulness. Complete restoration to health and a gain of twenty pounds in weight followed this work. The nerves and vessels in the jaw were not injured and no paralysis resulted.

Before my class at the New York Post Graduate Medical School and Hospital on March 25, 1893, I operated on a lad fifteen years of age who gave the following history:

Three years before, while at play he ran against a lamp post, striking the left side of his face and bruising it severely. A year later there appeared on the face, over the molar bone, a hard lump which continued to increase until it was the size of a hen's egg, preventing the boy from seeing with that eye objects on the ground

near by, without bending his head. He had not realized any special pain or discomfort from the tumor. Thinking the trouble arose from the abscessed teeth, his dentist extracted the upper left first bicuspid, which showed no evidence of being diseased. I diagnosed an osseous tumor of the antrum, and found that the malar and superior maxillary bones were completely destroyed by the direct pressure against them, only the periosteum remaining. Not only was the tumor directed outward, but downward, depressing the roof of the mouth and extending beyond the alveolar process against the buccinator muscle. An incision was made through the periosteum encircling the teeth, as seen in the specimen here presented, in which the tumor and teeth are attached, and it will be noticed that only a small part of the alveolar process remained intact. This with the teeth was removed, the entire side of the face falling into the cavity made by their absence, so completely was the malar and the superior maxillary bones destroyed. The inferior orbital ridge and zygoma only resisting the pressure of the tumor. A profuse hemorrhage followed its removal, but was readily checked by hot water. The wound was packed with aristol and gauze, and the contour of the face secured. The periosteum united with sutures. Through this opening the wound was dressed until the shape of the face was permanently restored. Time of operation twenty-five minutes.

The following day there was considerable œdema which readily subsided. From day to day the dressing was changed until the periosteum could support itself, and in two weeks the case was dismissed from the hospital. The antrum was douched daily until restoration was complete. An artificial denture was made to replace those lost, to give the normal fullness to the mouth. In this operation there was no external wound, consequently no necessity for ligature and no scarring of the face which would necessarily follow had the operation been done on the lines drawn in general surgery. The wound completely healed in six weeks with no deformity of the face. I have seen the case from time to time and in every way it is eminently satisfactory.

On Feb. 3, '93, I operated on a gentleman 73 years of age who, up to the year prior to then, was in robust health never needing a physician in forty years. He stated that he applied to a dentist to have the left superior wisdom tooth, which was loose, removed, it having elongated, owing to the loss of its antagonist. As the dentist was using the forceps, the patient noticed they were covered with blood, but before he could rebel against this outrage, a tooth had been extracted, which was found firmly attached and resistant. He saw that a sound and healthy tooth had been taken out by mistake. The dentist then removed the loose tooth with slight inconvenience. The wound made by the extraction of the teeth

did not heal, and the gums around it became swollen and inflamed, the remaining teeth on that side soon were loose and sore. In three weeks they were so troublesome that with his fingers he removed the first molar. He then noticed an opening into the antrum and that granulations protruded.

About two months after, the bicuspid was extracted in a similar manner, and in two weeks later the cuspid. The entire side of the jaw became very painful; the patient was unable to sleep or take proper nourishment and rapidly diminished in strength and health, until at this time, Feb. 3, he was extremely emaciated, not having taken solid food for weeks and for the past three days only water, because of the great pain in the effort to swallow.

Examination revealed a deplorable condition of affairs; the entire left half of the jaw and cheek were infiltrated. The microscope showed epithelioma. The characteristic cancerous odor prevailed. An incision was made anterior to the right cuspid and extended back and across the soft palate to the condyle, down the ramus, and forward along the buccal surface of the jaw to cuspid upward and forward, until all the mucous membrane to the median line was removed. The entire enclosed area was then resected, leaving only the external portion of the malar bone and the orbital ridge of the superior maxillary in position. In operating, I removed a portion of the anterior lobe of the parotid gland, along with the duct. The hemorrhage was profuse, but was completely checked in a minute by hot water. The wound was dried, packed with aristol and gauze, no ligatures being employed. Time of operation, twenty minutes. The patient made a splendid recovery, slept comfortably much of that night and had but slight rise of temperature. There was some oedema of the face which lasted three days. Patient received most nourishing diet and was sitting up in three days. On the seventh day following the operation, the case was for the first time dressed, no untoward symptoms arising in the meantime. The packing was perfectly dried and scarcely blood-stained; not a drop of pus was present. The wound was repacked, but loosely, and redressed every third day without a single complication. On Feb. 17th, patient was dismissed from the hospital with instruction to douche the wound frequently. The wound made rapid progress in healing, and on the thirteenth day of March, it had almost completely closed, leaving but a single opening into the antrum, so that on the 30th day of March, the impression for an artificial denture was taken.

The patient's health had wonderfully improved, he being free from pain and slept soundly. He was able to resume the management of his affairs and was again in good health, continuing so until August, '94, when he contracted pneumonia from which he died. Two months prior to his death, the cancerous granulations

appeared in the old wound. There was no disfigurement of the face from the operation, and the only inconvenience was the loss of his natural teeth, as he was unable to wear the artificial substitute.

A lad 13 years of age was brought to me in March, 1893. Giving a history of complete nasal stenosis of some years' standing, a clear history of adenoids. He had been under medical care for years, the physicians failing to recognize the cause of his trouble. The discharge of pus from the mouth and nose caused the physician to refer the patient to a general surgeon, who in turn, referred the case to me, with the statement to the parents, that he believed the preservation of the jaws was preferable to their removal which would result in a hideous disfigurement from an operation at his hands. I have never operated on a more lifeless and waxy looking creature. The odor from his breath and body, which was steeped in pus, was most sickening. There was no time to lose. Desperate chances had to be taken to save his life. All of the upper oral and bicuspid teeth were so loose that but for the periosteal attachment they would have dropped out. There were large sinuses under the lips and the roof of the mouth through which pus exuded. The periosteum of the roof of the mouth was so filled with pus that it bagged. All of the bone of the superior maxillæ, anterior to the first molar including the palatal plate was necrosed, likewise the palatal bones and the inferior turbinates. The adenoids completely filled the nares and crowded into the antrum of Highmore, breaking down the walls, and advanced until the process of destruction was complete.

Pus oozed from all the loose teeth and through the sinuses, nose, mouth and out up through the lachrymal ducts into the eyes. The throat was so plugged up that breathing was very difficult and pyalism extreme. At this operation I removed what I could of the adenoids, opening the nasal passage and partially cleaning the antrums, which was done with great difficulty, as the boy took chloroform badly, owing to extreme anæmia; the loss of blood was not so very great.

The loose teeth were supported by ligatures until held by the new bone.

The patient made very good recovery from the operation, and in forty-eight hours the improvement was noticeable. The wounds were dressed daily and through the sinuses douched every hour. Recovery was so rapid that in four weeks I was again able to operate, this time removing all of the necrosed bone and thoroughly curetting the antrums.

The boy made rapid strides toward recovery, and by May 1st I was able to perform the final operation, when I removed the remaining adenoids. Here occurred a profuse hemorrhage, but with per-oxide and hot water it was quickly checked.

Most stimulating tonics and nourishing diet were prescribed from this on. Recovery was marvellous, so that in two weeks the patient was able to walk to my office for treatment. By June 1st, he was dismissed cured, having gained 40 lbs. in weight, having regained his normal color, good appetite and usual strength. He then went to his country home. I saw him again in one year. There was no occasion for treatment, with the exception of a slight imperfection in the alveolar process, where there had been a deep sinus, the gums did not unite and a few adenoids had put in an appearance. The only additional opening through which I operated, was made where I extracted the left superior molar, this being so badly diseased I considered it well out, and through which I was better able to reach the antrum.

To facilitate cleansing of the wound and destruction of the pus, let me recommend to you Electrozone, the best of all agents I have found for this purpose. Under its use the pus melts away like the dew before the morning sun.

I have done many cases similar to these stated and without deformity in any instance. All of them are accompanied by blood-poisoning and have usually been treated for rheumatism, malaria and typhoid fever for months and even years, before the error is discovered.

This conservative method is not conducive to a fine collection of pathological specimens, as a recovery of a part without blemish leaves only the history of the case and the statement of the patient as proof of the malady.

The student should have a chance to see in practice the methods he wishes to adopt. In this city, only recently, at our great University no end of strife resulted from a determined and successful effort of the dental department to make a place in the hospital for their oral surgeon, with equal right to operate. This was the beginning of the end when all such institutions must of necessity adopt the same course. Why confine this work to so-called major operations when they can be simplified to the minor class by annexing such men skilled in dentistry and medicine alike to the medical faculty?

Let us hope that the controllers of such faculties will appreciate that "Knowledge is power," and that new methods are a necessity.

7 West Fifty-Eighth Street.

TREATMENT OF PULPLESS TEETH.*

By A. J. HUSBAND, L.D.S., Toronto.

For convenience of description, we will divide pulpless teeth into those presenting with pulps recently dentalized by medication; second, with putrescent pulps; third, with acute alveolar abscess without fistula; fourth, with fistulous opening; and fifth, preparatory to inserting pin crowns.

In the first case we will suppose the pulp dentalized but not removed. Adjust the rubber dam after cutting away the decalcified dentine, make a free opening into the pulp chamber, not hesitating to sacrifice good tooth substance in order to secure light and thoroughness of manipulation. Endeavor to remove the pulp by inserting a barbed brooch well up the root, twisting and withdrawing it with very often the pulp attached. In refractory cases I find that with the Evan's root-drier inserted hot the pulp will adhere to it and come away easily. Having the pulp removed, check the hæmorrhage, if any, by injecting into the canals pyrozone; for this purpose use the minim syringe. Whether there is any bleeding or not, I wash out with pyrozone, followed by sodium-peroxide, this last for the purpose of saponifying any remains which may be left; wash this out with applications of water and dry thoroughly with Evan's drier or hot air or both. Wipe out the roots with oil of cinnamon on a fine brooch, fill with chlora-percha, using one or more gutta-percha cones to displace surplus liquid. In this class of teeth I deem immediate filling the best.

Second: Putrescent pulps. Secure all the cleanliness possible by removing softened dentine and washing out the cavity with tepid water before adjusting the dam. After the dam is applied swab out the cavity with pyrozone and evaporate moisture with hot air, secure free opening into canals, reaming them out if the margins are soft; wash out thoroughly with repeated applications of pyrozone. In washing the canals with H₂O great care must be exercised not to use too much at a time. I use the minim syringe and inject a very small drop at a time, wiping out and applying repeatedly until effervescence ceases, followed by sodium-peroxide; wipe out canals with cotton wound round a fine brooch until all discoloration ceases. Again use hot air or Evan's drier, followed by an application of oil of cinnamon, and fill as in the previous case.

If it is impossible to check the discharge I fill the root with cotton

*Read before Toronto Dental Society May 12th, 1897.

saturated with pyrozone and mercury bichloride 1 in 1,000 equal parts and renew every 2 or 3 days until discharges cease.

Third: Acute alveolar abscess without fistula. These cases usually present with swollen faces and extreme soreness of the teeth. My first treatment is simply to secure an opening into the pulp chamber. I dismiss the patient then until soreness disappears, when I can operate comfortably for both of us. I know there is a great outcry against this procedure, but I follow it nevertheless, deeming the treatment equally efficacious and considerably more human than any other that I know. After soreness has disappeared I treat as in former cases.

Fifth: Cases with fistulous opening are treated by opening fully into canals and cleaning them as well as can be with brooches and then forcing pyrozone through the fistula with a hypodermic syringe, using a washer of gutta-percha to dam up the canal to prevent return of liquid. This is followed by aromatic-sulphuric acid injected in the same manner and the roots dried and filled at once with chlora-percha and gutta-percha points as formerly. In some cases where it is deemed expedient to open into the canal from the tooth, I follow the track of the fistula with bars, scrape the end of the root, or as I think better still, extract and replant.

Fifth: Before inserting pins for any purpose after treating the root as in the former case I fill the apex with tin to prevent cement from being crowded through.

THE CHOICE OF A FILLING MATERIAL.*

By DR. DAVIS, London, Ont.

In the consideration of this stereotyped subject we shall not attempt the elucidation of anything original or new, but will endeavor very briefly to give a few personal impressions formed regarding the various filling materials, after a number of years of active practice. We shall not strive to treat of anything other than that demanded by our subject; we shall not speak of the great advances which have been made in the filling of teeth for two reasons: first, that our text does not require it; and, in the second place, in our humble opinion we have not progressed as a profession as we should have done in this all-important branch of our most noble calling. It is a deplorable fact that prejudice, in many cases, is more powerful in the influence exerted in our judgment, in the filling of teeth, than the great thought of tooth-conservation. I must fill this tooth with this or that material,

* Read at London Dental Society.

because I must demonstrate by my acts, that I am in favor of the specific class of filling materials as advocated and adopted by me. Thus it is that teeth of poor structure, of frail walls with decay encroaching on or near the pulp, is filled with a material totally incompatible with the tooth substance and its surroundings. Another consideration which largely influences the operation is, the amount of the remuneration to be received for the performance of the operation. "Doctor, what is the best filling to be put in that tooth?" is the question propounded by hundreds of patients, nay thousands, daily, and the skilled dentist mentally calculates the size of the questioner's pocket-book before replying. If perchance the carriage and coachman await the patient's exit from the offices, the reply invariably is: "Oh, that tooth must be filled with gold;" on the contrary, if the patient shows by the mud on his shoes and his general appearance that he has "footed it," and that "filthy lucre," with him is very scarce, the reply is: "Oh, amalgam, or some cheap filling will do to fill that tooth." Need we say that this is all wrong; we believe that every tooth more or less shows indications of the proper material with which it should be filled, and in every case the dentist should be sole judge of the filling materials to be used and he should honestly insert that material which he conscientiously believes to be the proper filling for that particular tooth. What have we seen, not once, but hundreds of times? that a tooth filled with gold in the mouth of a rich man is decayed cervical wall and generally shows signs of disintegration and demoralization, while a tooth similarly decalcified, and, under analogous circumstances, in the mouth of a poor man, which has been filled with an amalgam made from silver coin or a similar-made alloy filled up with a rubber file, rudely inserted, in an improperly prepared cavity and imperfectly protected from the fluids of the mouth during the operation, remains in as perfect a condition as the day the filling was inserted. Oh, for the day to speedily come when the dentist will be paid for his manipulative skill, his knowledge of Dental Pathology and Therapeutics; and the time spent in the perfecting of himself in his profession—rather than for the difference in cost of the filling material. The idea of cost is fostered and nourished by all the several grades of the profession, from the dentist of such standing and such repute, that he does not even need a silver plate to inform us as to the whereabouts of his office, down to the abominable, miserable, damnable quacks who make you feel sorry for your calling, when you see their glass cases at their door, on which is ostentatiously displayed the information that "Extraction 25cts.; is malgam fillings, 50cts., while gold only costs 75cts a cavity." Let us here digress for a moment, to correct an error which exists, that vulcanite indentures and amalgam are responsible for the

deterioration of our profession. We have invariably noticed that the silver-plated glass cases at the doors of these who have the title of D.D.S. and L.D.S. always contain choice specimens of gold fillings inserted in the most inaccessible cavities of decay, and also magnificent full dentures on the finest of gold plate. We must go deeper than this for the cause of quacking; we must admit that the majority of quacks are incompetent men, yet a hasty desire to obtain a good practice, and at the same time get rich, which actuates the mind of many a young graduate, is responsible for the increase in the vast army of those despicable creatures of whom it is a disgrace to that noble bird a duck to call quacks. We believe that students should be taught that once a quack, always a quack. How often have we been told by one of these young men: "Oh, I am just quacking until I get a practice." We have never yet seen one who has been able to shake himself from his environments and become eventually a professional gentleman. In addition to this we believe that the reputable members of the profession should deal differently with these creatures. A man can be at times too much of a gentleman. We do not put on a full dress suit of clothes to clean out a sewer, nor should we stand on what is professional and gentlemanly etiquette in dealing with these outcasts of a noble calling. To be gentlemanly with them is the most flagrant case of casting pearls before swine. But to return to our subject, what should be the great desideratum in the choice of a filling material? We unquestionably answer, "Tooth Conservation." This comprehends everything; manipulative skill being conceded, we say, that a filling, even without beauty, that will maintain the tooth structure by being compatible with, that will save the pulp from irritation through being non-conducting and non-irritating, is a better filling to insert into a particular tooth, even though it has to be renewed in the course of every few years, than a filling which has every appearance of being beautiful, has great resisting power which, in itself, resists completely the action of the fluids of the mouth and the power exerted on it by mastication, and while it *per se* is as good in every way as the day it was inserted, it stands as the Emperor William did when he entered Paris at the close of the Franco-Prussian war, to see the ruins he had created.

This is no fictitious case, we have seen hundreds of cases of this kind. Beautiful fillings, nicely condensed, finely polished, exquisitely contoured standing intact and beautiful, while the surroundings are those of demoralization, disintegration, ruin, decay, and death. Prejudice, remuneration and beauty in these cases were the governing considerations in the choice of a filling material. The operator has received the money, the patient a short period of beauty, while the poor tooth, to speak vulgarly, "has got it in the

neck." This is not only vulgar but true, as it is generally that part of the tooth anatomy that shows first the mischief created by the operator's greed for money, his desire to have people to be his patients: "Who put that beautiful filling in for you?" and also the patient's folly in the desire to have a filling that presents a fine appearance, as if this was only the great desideratum. Let us not be misunderstood, not be misinterpreted; we believe that in many cases gold is one of the best, if not best, materials to fill teeth. In teeth of hard, dense structure, in which the cavity of decay does not impinge on the cervical wall of the tooth, gold can properly and advantageously be used as a filling material. We have seen gold fillings inserted in such cavities, and they stand as monuments to the manipulative skill and wisdom of the practitioner who so successfully inserted them. In these cases we have consideration of the teeth, also beautiful fillings, hence gold was the proper material to be inserted in those and similar cases. Now, in teeth in which we cannot (in view of the fact that we wish to conserve or preserve the teeth) introduce gold,—what materials are at our command? We will not here speak of an ideal filling material, we have no such; we know what its qualities should be, such as regards color, non-conductive, non-irritating, easy of manipulation, etc., but seeing that, like the ideal man, it is not here, but in heaven, we shall deal with what we have.

The first is amalgam—let us first define what an amalgam is. We cannot give a better definition than that of *Prof. Flagg's*, viz.: "One or more metals held in combination with mercury by the mercury form an 'amalgam'!" This abused metal was born under most unfavorable circumstances, in fact, in the home of quackery; yet, in spite of its inauspicious birth it has risen above its primitive surroundings and become a respectable and most worthy member of the noble family of desirable filling materials. No filling material has undergone such tests as the descried material. Those who used it were threatened with dental excommunication, and some members of the profession who were convinced of its utility as a conservator of tooth material were formally excommunicated from the American Society of Dentists, for their temerity in using, and also advocating its use to others. These pioneers in dental advancements found that amalgam made from dental alloy unscientifically compounded, rudely and improperly introduced into cavities of decay, imperfectly prepared, "saved the tooth." Thus it was that many a tooth remained in the mouth of the patient to do excellent service for years, instead of being rudely consigned to the dental cuspidor. If this were the result in the past, what should be, and we say is, accomplished with amalgam to-day, when it is prepared on scientific principles when it is accurately tested, and when it is properly inserted into

the cavity. True, it has its defects as we said before, no filling material is perfect, notably, its color, yet it is better, we opine, to have a badly discolored tooth in the mouth than no tooth at all. Far a broken down tooth, if poor structure, with frail walls filled with amalgam. With this, we shall remember that the amalgam used shall be such that the necessity of the case demands submarine facing, front tooth or contour. Another desirable filling is gutta-percha; this material has suffered in comparison with other filling materials, on account of defective manipulation. It is not our intention to speak of intermediate fillings, or those that are used to live cavities, hence we shall not mention this, that in large buccal cavities, having frail walls, gutta-percha should be the filling material; we remark in this connection, that the gutta-percha should be properly warmed and properly introduced, using for these purposes a gutta-percha warmer and instruments specially designed for the exclusive introduction of these fillings. We could go further and speak of zinc-phosphate, oxy-phosphate, oxy-sulphate and oxy-chloride of zinc and numerous other materials, yet we surmise that we have subserved our purpose, and end our paper with the saying, that tooth conservation should be the first consideration in the choice of a filling material, qualifying this statement by the remark, that if a tooth can be saved equally well with a filling that presents a beautiful appearance as with one that does not, the preference should be given to beauty, otherwise the first consideration—tooth conservation should invariably govern.

PRACTICAL THINGS WITH ILLUSTRATIONS.*

By PROF. J. G. TEMPLETON, Pittsburg, Pa.

In your programme, I see that one of the subjects is "Popular Dental Education." Now there are so many ways to educate people, and we obtain our education through so many different channels, that we have thought to suggest two things as being worthy of particular attention by our profession at the present time. They are, first, a much better preliminary education as a qualification for entering our profession; and, second, "*The suppression of the horrible* in dentistry."

However, I suppose that the meaning of the phrase, "popular dental education," has reference to the laity, so to speak, or the people at large. As it is well known to us that there is scarcely

* Read Before Ontario Dental Society.

anything with which they have more to do, and yet about which they possess so little correct knowledge. Now in reference to the best method of disseminating the proper information, it has long been in the mind of the writer that the best method for the diffusion of correct ideas concerning the duties and operations of the dentist, would be carefully prepared lectures delivered before all our teachers' associations, supplemented by giving the same before the advanced classes in all our schools.

THE MAKING OF ARTIFICIAL DENTURES A FINE ART.

Yes, so it is. But when we go among the people and see the horrible imitations called artificial teeth in use by the people, we are inclined to think that the fine art part of what we see is quite a joke. Hence the conclusion, that the suppression of the horrible is greatly needed. It is no honor to us, that in this age of progress in the arts and sciences, so many evidences of the low standard of art in prosthetic dentistry should be seen everywhere we go. Yes, *false teeth* everywhere; they grin at us in the street, at church, in the theatre, everywhere, like a horrible nightmare, while the poor, unsuspecting victim seems to enjoy their hideousness. No wonder artificial teeth can be had for such a low compensation; they all look alike—like a job-lot, for this reason educated people have a perfect horror of them and feel robbed if they have to pay anything for them. One great defect of many sets of teeth, as we see them in use, is their youthful appearance; they look as if they had been borrowed from some younger person. The dental artist, like the sculptor and portrait painter, has the artist's license to make his subject look a little younger and, if possible, more beautiful; but if he should err by carrying this too far, he then produces a caricature and the result is just the opposite of what he hoped to accomplish, and from what we often see, we are very often inclined to think that many dentists must be color blind or else we would not see so many sets of artificial teeth the color of well watered skim-milk. The remedy is, educate the people æsthetically.

TO KEEP INSTRUMENTS NICELY POLISHED.

Burnishers give better results when new than when tarnished, and it is essential to keep them finely polished; in fact, it is desirable to keep all instruments polished. An efficient device for polishing can be made by fastening a piece of sole leather on a block of wood of suitable size and placing a little diamantine powder on this surface. Diamantine is used by jewelers and can be obtained from them or from their supply houses. Diamantine is nothing more nor less than oxide of tin, and can be obtained from a wholesale drug house for about sixty cents a pound.

TO MAKE GUTTA-PERCHA FILLINGS MOISTURE TIGHT.

Dry the cavity well, place in it a pellet of cotton saturated with absolute alcohol ; remove the cotton, and with a warm air syringe, evaporate the alcohol ; varnish the cavity with a solution of common resin in chloroform, warm the gutta-percha and pack into the cavity with a cold instrument ; heat a thin-bladed instrument and pare off the surplus filling, after which a fine polish can be given to it by rubbing with a little oil of cajeput.

PLACING RUBBER DAM ON LOWER FRONT TEETH.

A slip noose can be put on the lower front teeth with one hand, while the rubber dam is held down with the other ; get the slip knots ready first, draw them tight and they will hold as long as wanted.

THE USE OF BEADS.

The use of clamps can very often be avoided in filling teeth by tying one or two small beads near the middle of the string used as a ligature ; after placing the rubber dam, tie the ligature so that the beads will come on the lingual side of the tooth and the rubber dam will not slip off over the beads.

EXCAVATORS.

The writer is of the opinion that the old fashioned excavator and bur drill should be used in the preparation of cavities much more than they are now ; we are inclined to think that the engine is relied on too much for this purpose.

THERMAL CHANGES.

To protect from thermal changes, particularly in deep cavities where the pulp is not quite exposed, first dry with bibulous paper, then apply, on a small pellet of cotton, absolute alcohol which has a strong affinity for any moisture that may be left in the cavity or open ends of the tubuli ; when the cotton is removed, evaporation takes place rapidly, leaving the cavity perfectly dry. Now varnish inside of cavity to near the margin with a solution of common resin in chloroform or of gum sandarach, dissolved in sulphuric ether, then take a small piece of asbestos felt, moisten with pure wood creosote campho-phenique, or oil of Eucalyptus, and cover the side to go next to the pulp with a mixture of iodol oxide of zinc and vasaline ; after this is in position in the cavity, place over it a thin piece of lead or a thin piece of aluminum plate, which will prevent pressure against the most vulnerable point in the bottom of the cavity, while inserting either a gold or other metallic filling. We often cover the bottom of deep cavities with a jelly made by mixing carbolic acid and colodian together, then absorb the acid with

cotton or bibulous paper, which leaves the colodian residuum of a leather-like substance, and over which we place the asbestos, and we think we have an excellent remedy against thermal changes.

TO TAKE A PERFECT IMPRESSION FOR PARTIAL UPPER PLATE.

To take an accurate impression of the mouth for a partial upper set of teeth, smear plaster over the roof of the mouth with the finger, take a string about a foot in length, tie the ends together, put the tied ends of the loop into the plaster on the roof of the mouth and add more plaster to thoroughly imbed the knot, leaving loop of string hanging down. In placing the plaster in the mouth, care should be taken to have it come full half way over the grinding surfaces of molars and bicuspids and also cutting edges of the front teeth; then trim the plaster and varnish the trimmed surfaces. The plaster should be so trimmed that it will fill up fully one half of all spaces between the teeth; then cover all the remaining surface of the mouth and teeth with plaster, being very careful to have the teeth well covered and spaces filled in, putting plaster for the buccal and labial surfaces. When set, the plaster impression readily parts where it has been varnished, the palatial portion is dislodged with the help of the string used, and the pieces are then placed together and model made. If a tooth is irregular, use modeling compound about it and trim suitably, then apply the plaster. When removing, it breaks where joined; then remove compound, place in position in the impression and pour the model. Before pouring, the impression should be coated with a lather of soap and then immersed in water for about ten or fifteen minutes. When the plaster has had sufficient time to set, separation can be made, and a model thus obtained will not have any of the fine lines obliterated.

ARTICULATING TEETH.

Always take an impression of the lower teeth when making an upper set, and in taking the bite, have wax trimmed to show the length you wish the teeth to be, and bite into it just sufficiently to show the tips of cutting edges and cusps where the model made from lower impression can be placed in proper position, etc. For double sets, make wax models for contour in restoration of features and to show length of teeth, and then try these models in the mouth, being careful to see that you have it right; then make plaster articulating models for setting up the teeth, setting up the lower ones first against a plaster articulating plate, its articulating surface corresponding with the articulating surface of lower wax model; then lay aside the plaster articulating plate and put the

model of upper jaw in its place and set the upper teeth to the lower ones. The writer adopted this method about twenty-eight years ago, and in that length of time has not had to grind a cusp off to let the front teeth come together. But a more elaborate description of this seems to be required in order that it may be understood and adopted as a practical method. Having to make a full upper set of teeth, we will suppose the impression and model to have been made in the usual way. Take modeling composition, soften and flatten out until it is about a quarter of an inch thick, press it on the model while warm and then cut and trim to make a trial plate for the purpose of taking a bite. It should fit the model accurately. Melt a little wax around on the ridge, then press a roll of softened wax on that and trim to what you think would be a sufficient length, then try in the mouth and carefully trim the lower edge to the proper length for the teeth; if it is not, either add to or cut away until it is found by trying in the mouth that the wax represents the proper length. This wax should be so cut on its articulating surface that all the lower natural teeth will strike at the same time when tried in the mouth. Now remove and soften the articulating wax surface just a little over the flame, then replace in the mouth and do not let the patient bite into it until you have the head drawn well back so as to put the anterior muscles of the neck on a stretch; then have the patient bite a little on the wax just to get an impression of the cusps and cutting edges of all the lower teeth. Next take an accurate impression of the lower teeth, from which make a plaster model which will fit into the slight impressions of the teeth made in the bite taken, and then place the whole on any good articulator which can be set to maintain the relative positions. Remove the bite and you are ready to set the teeth to a correct articulation, and if all has been carefully done, the teeth will come together properly without any subsequent grinding.

For a double set (upper and lower) make trial plates of modeling composition to take the bite on, putting a piece of rather stiff wire in the lower one to stiffen it. Wax the ridges as previously described. Place a roll of softened wax on the upper trial plate, place the lower trial plate in the mouth, being careful to see that it is in its proper place, and hold it there while putting in the upper plate with the wax on it. Do not allow the patient to bite until the head is thrown back as far as you can get it; then tell the patient to bite, and keep the jaws closed until with the finger the wax has been well pressed on to the trial plates. Mark the centre or medium line on the wax. Have patient close the lips, and then take a small straight instrument and mark on the wax the height of the lower lip. This mark should extend from one angle of the mouth to the other; you then have the line of fissure or line of lip

closure ; in other words, the height of the lower lip and length of the upper to serve as a guide in making the wax models. After thus taking the bite, place each of the models in the bite so obtained, and fasten in any good articulator ; then prepare corresponding wax models, which should be tried in the mouth to verify their correctness. They should come together in the mouth the same as on the articulator, and if they do not they should be made to do so before proceeding further. Take particular pains to be satisfied that the wax models are correctly adjusted and give a natural expression to all the facial features, observing that the lower third of the face is in proper proportion or length with the upper two-thirds, and be sure to produce the proper fullness over the region of the upper cuspids to give as near as possible the natural contour. Then take the upper and lower plaster models off the metal articulator, and make a plaster extension to the back part of the upper model, on which place the wax models, which have been marked while in the mouth, so that they can be put in the same position out of the mouth. The lower plaster model is placed in position, and a plaster extension added to fit to that of the upper plaster model. After separating these, the lower wax model is placed on the lower plaster model, and the inside space filled with wet paper, and plaster is poured over all to make the lower articulating plate to which the lower teeth are to be set. Next place the upper model in position, after the lower teeth have been set, and set the upper teeth to the lower ones which have just been set to the lower articulating plate. Always set the lower teeth first. And in setting the upper teeth always set the bicuspid first.

Having made double sets in this way for twenty-eight years without having to do any grinding after placing them in the mouth, the writer is inclined to think that he has some claim to the conclusion that this method is a pretty good one.

To take a plaster impression with a small quantity of plaster, first take an impression in wax, and then cut away the palatal, buccal and labial surfaces to almost an eighth of an inch in depth, and over the surfaces thus formed cut slight lines in different directions, with about two teaspoonfuls of plaster spread evenly over said surfaces, and reinserted and held in place until the plaster has well set, and you have obtained an impression that has no thick body of plaster in any one place to cause uneven shrinkage.

TO DUPLICATE MODELS AND IMPRESSIONS.

Take printers' ink roller composition, heat in a water bath until well melted. Grease the model slightly with lard, and place it the same as if to mould a metal die, cover with a metal ring (a tin can opened at both ends will do), and pour the melted composition

over the model. Let this stand over night. By morning the material is hardened, and the model can be withdrawn. The composition being elastic it retains its shape, and a hundred models may be poured if necessary.

To prevent plaster from adhering to the palatine surface of vulcanite plate. Just before packing the case coat the model with a thick solution of soap, almost any kind of soap will do, but that which makes a thick lather in the shortest time is the best.

TO LINE VULCANITE PLATES WITH BLACK RUBBER.

Before packing, coat the cast three or four times with a solution of black rubber, allowing each to harden or dry before applying the next. In swaging aluminum plates, always keep the plates between two pieces of silk tissue paper, to prevent its coming in contact with either the lead or zinc, either of which metals is injurious to it. In swaging any kind of metal plate the writer has been in the habit of first stamping that portion of the plate which is to fit to the roof of the mouth, and the rest afterwards, as we shall show in our illustration.

MODELS OF MARBLE DUST AND PLASTER.

In vulcanite work the best results may be obtained by making models one-fourth marble dust and three-fourths plaster; also the same in flasking the case.

TO PREVENT RUBBER RUNNING BETWEEN JOINTS.

To keep rubber from running between the teeth and joints in vulcanizing, after the teeth are set in the first half of the flask, plaster, trimmed and varnished, pour water on all the teeth and joints, then mix a small quantity of pure plaster, have it rather thin, and with mixing spatula cover labial and buccal surfaces, also the joints, take up the piece quickly and bring it near the mouth, and blow rather sharply against the thin plaster all around, which will force it into all spaces between the teeth or blocks. After this finish flasking in the usual way, and, if possible, it is well to allow the case to remain over night in the flask before packing.

TO TRIM RUBBER PLATE.

In finishing vulcanite plates always trim the rim low over the bicuspid, leaving it high as can be worn over the cuspid, and the same over and back of the second molars; do not file rim to a knife-like edge, slightly bevel inside of rim at the top, extending down about three-sixteenths of an inch. In upper plates the back part, or that portion over the second molar should be left as high

as it can be worn, and in many cases the rim should project over the second molars, and also over the cuspids, such projections are often a very material help in retaining plates, particularly in that class of cases generally considered as unfavorable for retention.

TO MAKE PLATINUM AND GOLD PLATE.

To make platinum and gold plate, melt with blow pipe on a piece of platinum plate pure gold, and roll to desired thickness; the result will be as good as any you can buy.

GOLD SOLDERS.

Take a United States \$5 gold piece, 20 grains coin silver, 10 grains pure copper, 6 grains English toilet pins; melt the silver and copper together first; after melting this and the gold together, add the pins, flow into an ingot and roll, cut into small pieces and melt again if it does not roll well first time; this will give a solder a little more than 19 carats fine, and flows nicely on coin gold, being the same color. This we call No. 1. Now take of

No. 1.....	89 grs.
Coin silver.....	7 "
Pure copper.....	4 "

Melt together and roll, and we have a second grade which we call No. 2, and which will flow on No. 1. To make a still lower grade take:

Pure gold.....	6 dwt.
Copper.....	2 "
Fine silver.....	1 "

And you will have a 16 carat solder. In my practice only Nos. 1 and 2 are used, and are made according to the form 1 as given above.

TO SOLDER A CAP ON GOLD CROWN.

To solder a cap on a gold tube intended for an artificial crown lay the cap on about a tablespoonful of finely cut asbestos, put the tube in place on the cap, drop in the solder and a little powdered borax, then blow a yellow flame on the asbestos, all around the tube until the solder flows, and there will be no danger of melting the gold.

TO HARDEN PLASTER BOIL IN PARAFFINE.

To give your plaster casts or models the appearance of ivory boil them in pure white wax.

THE DIAGNOSIS OF LESIONS OF THE HEART BEFORE ADMINISTERING AN ANÆSTHETIC.*

By E. H. ADAMS, M.D., D.D.S.

The subject is not of my own choice, but one which was selected for me by the Committee on Papers as one which they thought of special interest to dentists. In dealing with the subject it is my intention to avoid technicalities and even the more accurate descriptions of the differential diagnosis of heart lesions, and simply explain the general principles of diagnosis of a disease of the heart as it may seem to me to be of importance or interest to the general dental practitioner.

It is but fifty years ago from October last when sulphuric ether was administered for the first time for the production of anæsthesia for the relief of pain. It was the desire to relieve the pain of tooth extraction which led Morton, of Boston, to discover the virtues of ether as an anæsthetic. Prior to this Horace Wells, of Hartford, adopting the suggestion derived from an exhibition of "laughing gas" by an itinerant lecturer, had utilized nitrous oxide gas for a similar purpose. While, however, to dentistry was due the credit of the discovery of the anæsthesia, there are few physicians who consider that the administration of chloroform or ether should be performed by dentists. With nitrous oxide gas the dentist is more familiar than the physician, and when we consider that previous to 1881 the Colton Dental Association of New York had administered nitrous oxide to 121,709 persons without a single death, and that the Drs. Thomas, in Philadelphia, previous to 1879, had also administered the gas to 58,400 patients with an equal immunity from harm, we must conclude that either dentists are capable of using nitrous oxide or that it is a very safe remedy, or both.

As regards the deaths from heart disease, due to the administration of anæsthetics, they are, in my opinion, rarer than is generally supposed, and when they have occurred it is just possible that with more care some of them might have been prevented, while in other cases there would have been as much or even more risk to the patient without the anæsthetic.

Many medical men are of the opinion that an anæsthetic of some sort may be administered in any case of heart disease where it is necessary to perform a painful operation, no matter of how minor a nature the operation may be.

They consider there would be less danger from the chloroform or anæsthetic used than from the nervous effect on the diseased heart from the pain itself. This rule has been followed by many

* Read Before Ontario Dental Association, July, 1897.

eminent surgeons and without any bad results, additional care only being taken in the administration of the chloroform or anæsthetic used.

But while the physician may risk this with impunity it would not be safe, for many reasons, for a dentist, no matter how clever or experienced, to risk his reputation by attempting to give an anæsthetic of any sort to a patient known to be suffering from heart disease. In case of death, coroners and judges and juries and public opinion would not be so lenient or charitable as in the case of a regular qualified physician. In cases where a death should occur in a dental chair where no physician was present, the fact that the dentist had prior to administering the anæsthetic made a competent examination of the heart, or had required a certificate of freedom from heart disease from the patient's physician, would in itself do much to condone the circumstances both in the eye of the public and of the medical fraternity. This remark applies only to nitrous oxide, cocaine and local anæsthetics, as it is my opinion that, save in exceptional cases, dentists should not administer chloroform or ether without the assistance of a physician. Most surgeons who recognize fully the great value of chloroform do not hesitate to acknowledge that it is not suitable for every case.

Dr. Hunter McGuire* considers it unsuitable where there is a nervously weak heart, and adds that "of all the elements of danger to my mind from chloroform fear on the part of the patient is the greatest. If the patient is, so to speak, in mortal terror of the anæsthetic the heart is nervously weak, and the hazard to life is especially great."

Dr. Julian J. Chisholm† states "*Diseased condition of the heart, regardless of kind, may make this important organ particularly susceptible to syncoptic influences when reflex action has full sway; hence we find violent emotional excitement a fruitful cause for mortality in subjects of heart disease. Many such persons having to undergo painful surgical operations in former times, before the introduction of chloroform, suddenly collapsed with the first incision, and they still die as of old when they are not protected by complete anæsthesia.*"

Should chloroform be freely given patients with heart disease, regardless of kind, who must submit to painful operations for the cure of some surgical affection, by its liberal use they are put in a condition of safety against all emotional and reflex annoyances, without which they could not escape trouble.

I look upon chloroform as the strong bridge which will conduct

* The choice of general anæsthetics, Richmond, October, 1887.

† Chloroform the best of anæsthetics, Baltimore, 1888.

patients suffering from serious heart disease safely over serious operations. As a surgeon in a large ophthalmic practise, I frequently am compelled to perform the most delicate and painful operations upon the eyes of timid patients suffering from heart-disease in some one of its varied forms. Cataracts occurring usually at an advanced age, most frequently between 60 and 85 years of age, are often associated with organic disease of the heart in patients enfeebled by senility. Prior to the introduction of cocaine, I never refused to give such patients chloroform. On the contrary, I urged its use. The only difference that I made in such cases over other patients, was by exercising even more care in establishing the safe stage of complete anæsthesia through the liberal use of the drug.

Dr. Wm. Martin Coates,* of the Salisbury Infirmary, says: "Although I have, during these 24 years, never been prevented from administering it (chloroform by means of Snow's inhaler) by extreme age or infancy, by chronically diseased heart, lungs or kidney, I have not had a death by chloroform. During these 24 years, I have never refused chloroform to any patient in whose case pain was anticipated."

Surgeon Major Lowrie,† a principal of the Hyderabad Medical School, who gave the results of the experiments conducted by him for the government of Nizam on the effects of chloroform as an anæsthetic, states that he found in the hundreds of experiments on dogs, that in no case did the heart become dangerously affected by chloroform until after breathing had stopped. This, he says, tallies with his own experience, for in 40,000 to 50,000 cases which he had superintended, he had never seen the heart injuriously or dangerously affected by it.

This Hyderabad commission differs from the conclusions of the commission appointed by the Royal Medico-Chirurgical Society and that appointed by the British Medical Association, and that also of the Boston Society for the Improvement of Medical Science.

H. C. Wood, in a recent article on Anæsthesia (Denin's System of Surgery, 1895, page 658), says:

"*Valvular disease of the heart* is sometimes alleged to be a positive contra-indication to anæsthetic agents. When, however, the organic disease does not produce any absolute functional derangement of the heart, and when the heart is in a fair condition of health, anæsthesia may be induced, providing the circumstances of the case are such as to justify the surgeon taking a slightly increased risk. The key to the situation is not the valvular lesion

**Lancet*, Dec. 23rd, 1882.

†*British Medical Journal*, Feb. 23rd, 1889.

but the condition of the muscle ; a loud murmur depends, to some extent at least, for its loudness upon the valvular lesion, but it is also dependent in part for its loudness upon the force which drives the blood through the diseased orifice. A loud murmur is therefore, on the whole, not more strongly contra-indication of anaesthesia than a feeble one. Indeed, as the feeble murmur is more commonly associated with feeble walls of the heart, greater care must be exercised when such a murmur exists than when a loud bruit forces itself upon the physician's attention."

Among the many distinct diseases of the heart may be mentioned acute-endocarditis, valvular disease of the heart, myocarditis, idiopathic hypertrophy, dilatation of the heart, fatty heart, neuroses of the heart and nervous palpitation.

It is more with heart disease in general that this paper has to do.

In myocarditis, we have to do with a lesion of the cardiac muscle itself, or of its nervous apparatus which can reduce the functional capacity of the organ for work and thus produce precisely the same disturbances of circulation as are produced in valvular disease of the heart by purely mechanical reasons. In most of the uncomplicated cases there are atheromatous changes in the coronary arteries usually coincident with a more or less general arterio-sclerosis. The diagnosis of myocarditis is by no means easy and certain. We must first make out the presence of heart disease in general. This is usually easy to do from the secondary symptoms of stasis, *i.e.*, œdema, the dyspnoea or difficult breathing, the irregular pulse and the increase of the heart's dullness due to hypertrophy or dilatation.

Auscultation shows the absence of a murmur and hence of valvular heart disease. We have always left the distinction between myocarditis and idiopathic hypertrophy of the heart and fatty heart. This it is almost impossible to make with certainty.

The chief cases of heart disease which are to be found in patients frequenting the dental chair, and those which it is almost always possible to distinguish by one physical examination of the heart are patients with chronic valvular disease of the heart.

In the more advanced cases, where there is much œdema, cyanosis, palpitation, difficulty of breathing, etc., the patient is already aware of his condition, or, if not, these conditions will readily excite the suspicion of the physician or dentist in charge. In heart disease, however, which is well compensated, the cyanosis is recognized only by the practised eye as a slight bluish tinge at the lips, the *alæ* of the nose, the checks, or the nails. As a rule the first and chief complaint of the patient is directed towards his difficulty in breathing. The shortness of breath, which increases on any physical exertion, and palpitation, come on quite early in many cases. Pain in the cardiac region is only rarely present in heart disease.

Among the first symptoms of oedemas are a slight swelling of the ankles or eyelids. It is only, however, by making a physical examination of the heart that an accurate diagnosis can be made in early cases. Before describing these methods of diagnosis, it will be well to understand the *general pathology of valvular disease of the heart*. Every valve of the heart, in order to fulfil its physiological task, must on the one hand open perfectly at the right time in order to furnish a free passage to the blood current through the appropriate orifice, and must, on the other hand, close perfectly and firmly at the right time in order to make any abnormal backward flow of blood impossible. It will readily be seen that if there is an acute or chronic endocarditis or inflammation of the lineal membrane of the heart and valves, that there may develop a contraction of the free edges of the valves or a shortening of the chorda tendinal, and so the closure of the valve cannot be complete. This we call an *insufficiency of the valve*, and when it affects the mitral valve is one of the most frequent forms of heart disease. On the other hand, as a result of thickening and calcification, and a result of adhesion, the valves may form, be united together, and thus, when the blood current should pass freely through the open orifice, the valve remains a stiff narrow ring through which the blood must force its way, and this we call stenosis of the orifice.

Mitral insufficiency, as has been said, is one of the most frequent forms of heart disease. The closure of the mitral valve occurs normally at each systole or contraction of the left ventricle. It prevents the return of blood from the left ventricle to the left auricle. If the mitral valve is insufficient and its closure is incomplete, at every systole of the left ventricle a part of the blood is accordingly thrown back from it into the left auricle. This abnormal backward wave encounters the blood current coming in an opposite direction into the left auricle from the pulmonary veins. Since these two opposing currents rebound against each other they cause a loud blowing systolic murmur in the heart. We hear this murmur loudest at the apex of the heart, and either replacing the first sound of the heart or in addition to it. The second sound is often obscure or inaudible at the apex.

Any dentist can readily familiarize himself with the sounds of the normal heart by means of a stethoscope, or, better still, with a phonendoscope or Marsh's stethophone. The latter instrument may be used with advantage even without removing the clothing from over the region of the heart. Once familiar with the normal clear and distinct hub-dub of the heart, it is easy to detect any abnormal murmurs in the region of the heart.

In mitral stenosis, which often develops as a sequel of a previous insufficiency, the auscultatory sign is a diastolic murmur at the apex. This is never so loud and blowing as the systolic murmur of insufficiency, but it usually sounds more rolling and rippling.

In insufficiency of the semi-lunar valves of the aorta there is a long-drawn loud-blowing diastolic murmur, which is heard loudest at the upper part of the sternum, or even at its left border.

Other forms of valvular disease are comparatively rare, and need scarcely be considered in a paper such as this.

While auscultation is by far the most important means of physical diagnosis, inspection, palpitation and percussion are also of importance. To utilize these methods of diagnosis it will be necessary to be fully conversant with the size, dimensions and position of the normal heart. The heart as a whole extends vertically from the second intercostal space to the sixth costal cartilage, and transversely from about half an inch to the right of the sternum to within half an inch from the left nipple. Posteriorly the base lies opposite the sixth and seventh dorsal vertebræ.

The whole of the anterior surface of the heart is overlapped by the lungs except a triangular space corresponding to the lower portion of the right ventricle.

By *inspection* you note any changes in the heart's impulse where it strikes the walls of the chest.

By *palpitation* you can determine the force of the cardiac pulsation; the frequency or slowness of the heart's action and its regularity or irregularity, and also, if present, the "purring tremor" or purring thrill, a peculiar sensation felt by pressing the hand over the heart.

By *percussion* we determine the exact outline of the heart itself, and note any increase of size or position, and thus show any hypertrophy or displacement. It is best performed by applying the palmar surface of the left index or middle finger to the chest wall and striking with one or more of the fingers of the left hand. By this means the dullness, flatness or resonance, etc., of the organ percussed is noted.

THE STUDY OF ANATOMY.*

By W. C. BARRETT, M.D., D.D.S., M.D.S., Buffalo, N.Y.

This association has wrought a great work in securing the adoption of something like uniformity of action in the admission of students, and in the raising of the general educational standard. If one would have some comprehension of its beneficent influence, he has but to reflect upon what was the general character of American schools, and what their reputation abroad before the

* Read by request before the National Association of Dental Faculties, Old Point Comfort, July 31, 1897.

organization of the National Association of Dental Faculties, as compared with the present condition. And yet it has done but a small proportion of its manifest duty. Its accomplishments have been elementary.

It is not too much to say that our professional reputation must be what our colleges make it. We are the educators of those who are to be the leaders in the professional matters of the future. The next generation of dentists will be what we shall make it. Legislators may pass laws to regulate and restrict dental practice, but the stream can rise no higher than the fountain-head, and the practitioner of to-morrow must get his training and derive his professional knowledge from the school to-day. He must enter the profession by submitting himself to our guidance. The colleges are the fountain-head, and the stream will be limpid or foul according to whether we purify or contaminate it.

This should be a proud position. It certainly is a responsible one, and woe betide the college professor who does not realize his accountability. The man who accepts the honor which may appertain to this distinguished station, without striving his utmost to be in every way worthy of it, to fulfill every duty with an eye single to the best interest of student and profession, is unworthy a place in our ranks. He who assumes to arm the young men of our country for the battle of life, to fit them and equip them for an honorable career simply that he may minister to his own good, who takes the teacher's place and ascends the instructor's rostrum from selfish motives, is a worse hypocrite than the preacher whose every-day life belies his own sermons.

I believe that we are all sincere in desiring to make our schools, and through them the profession, all that they should be. To secure this it is not enough that we look solely to the preliminary qualifications of those whom we accept as candidates for a confidential position in American families. We need to make our instruction as perfect as possible. This cannot be done unless there is a generally accepted standard, and some uniformity in system. At present one of our greatest sources of weakness lies in the fact that there is no common comprehension of a standard of methods. One school begins instruction with the alphabet, proceeds to the construction of simple words, and by regular gradations to the building up of sentences. Another commences by an analysis of the sentence into its component words, and then studies the elementary symbols constituting the words.

That is, one teacher is synthetical, and the other strictly analytical. A student takes his first and second year in one school, and then circumstances or inclination cause him to finish his course at another. He commences under analytical teachers, and closes with a school that only arrives at the stage of analysis in the clos-

ing year. Hence, in reality that student never reaches the end of any regularly graded course. In this way the practical efficiency of that graduate can never be assured. Let me illustrate this by the various methods of arriving at a knowledge of that basal study in all schools that attempt to teach the healing art—*anatomy*.

Some teachers open their course with an examination of the elements of which the human body is composed. That is, they begin with *histology*. They commence with the cell, and after having given a fair knowledge of that, they proceed to construct the cells into tissues, which are then considered. Then the tissues are built into organs, and finally the organs into the systems which they compose, and they do not arrive at a consideration of the human body as a whole until the last year.

Another pursues the opposite course. He begins with a study of the *anatomy* as a complete system. He considers its functions, and then goes on to study the organs whose actions make function, and finally to the ultimate elements of which organs and tissues are composed, and whose aberrant functions afford the pathological disturbances with which it is to be his life's work to battle.

The student who spends his first year in a school that begins with *histology*, and who goes to one that ends its course with tissue elements, never gets beyond elementary matters in his entire college training. This certainly will not tend to make the best practitioners, or to raise our profession to its highest point of efficiency. There should be a comprehension of the benefits of each method, a careful discussion of the merits of all systems of teaching, and an intelligent and discriminating adoption of that which is best. To this end I have accepted the invitation of the executive committee to bring this subject before you.

I am a believer in the analytical system. I think it is easier to arrive at an understanding by taking in pieces that which we do not construct, and thus get at a knowledge of the mysteries of that which we must attempt to repair. Let me give you my reasons for this faith, and then please allow me to listen while you show me wherein I am wrong, or confirm my prepossessions by your own corroborative testimony. Do not then understand me as speaking dogmatically when I propose the following methods in teaching *anatomy*, but only as offering suggestions.

Our sole reason for examining tissues and organs is that we may learn their action and function. Hence, we should begin with function. This requires that the preliminary examination should be of the system, and not of its organs. The study of *anatomy*, then, should commence with a general examination of the body as a whole. In a dental school the first year should be devoted to general *anatomy*, beginning with *osteology*, or the framework. Then the viscera should be taken up, and their general morphology

and function should be studied. This should be followed by myology, syndesmology, and neurology, that a fair idea of the whole body may be obtained. Practical anatomy should be commenced this term, and one extremity dissected. It has sometimes been urged that the student should not dissect until he has learned something of anatomy. This argument would be cogent if the object were to learn how to dissect. But we dissect to learn anatomy, and do not learn anatomy to discover how best to dissect.

All the study of this year should be general. Not a hint of any specialty should be given, and hence the teacher for this year is preferably a medical man. If he is a dentist, he is apt to introduce his specialty too early. The general study of the human body should be finished in the freshman year.

In the second, or junior year, the student begins to differentiate in his study. He should now take up regional anatomy. He has finished the study of the body as a whole. Not that he has learned all that he should, but he has devoted all the time that can be spared out of a three years' course, and he takes up the study of the part to which he is to devote his attention as a specialist. His field is bounded below by the clavicle, and he must have a special, definite, intimate knowledge of all above that.

As a part of this he commences the study of dental anatomy. The first step in this is comparative dental anatomy—that is, the study of the dental organs as a whole, precisely as he began the first year in general anatomy. The dentist who learns nothing of the general relations of the teeth, and whose comprehension of them is only that they are organs out of which he is to pick his living, cannot claim any scientific knowledge. The teeth in all the different classes of animals should be generally studied, until the dentition of man is reached, when his teeth should be intimately studied in all their anatomical relations. The anatomy of the second or junior year is, as a whole, devoted to organs, as to that of the first year to systems.

No man can finish the anatomical studies necessary to dental practice in two years. He imperatively needs the third year, and this should be given up to careful examination and investigation of tissues. In this year the microscope is a necessary adjunct. The student has now learned enough of function to comprehend how it modifies, or is modified, by structural development. In this third and finishing year he does not entirely confine his attention to histological anatomy, but he continues regional anatomy, because he is not yet sufficiently familiar with the organs, especially of the head. He also bestows considerable attention upon surgical, and morbid, or pathological anatomy. But his chief attention is given to structural, or histological anatomy, and he thus finishes his course by attention to the minutæ and detail for which he is

unprepared during his first or second year, because he has not then the general knowledge to allow him fully to comprehend it, and because his mind usually is not sufficiently trained and disciplined to give him mastery over his attention.

The student who thus advances by regular gradations each year, separately taking up and mastering a definite branch or part of the subject, will be likely to retain his knowledge, because he has advanced toward it by a direct route, and because each division is made subsidiary to the next, and there is a regular gradation and progress.

If such a system, or if some other regular system, can be adopted in its general features by all of our schools, the grading of one who for any cause changes his college during his course will be greatly facilitated, and he will not be likely to miss any of the subdivisions. Our graduates will be better qualified for practice, and the tone of the profession will be elevated.

I would pursue the same general plan in the study of chemistry and physiology, the other basal studies of the theoretical curriculum. They should extend through the entire course, the last year in each to be devoted to special instruction adapted to an exclusive dental practice.

Materia medica should begin with the first year, but therapeutics cannot be profitably commenced until the student has obtained some knowledge of drugs, and hence it becomes a second and third year study, materia medica extending over the first two years.

Embryology properly belongs to the second year, because its study demands an acquaintance with technical terms that are all unfamiliar at the outset, and because it is an intricate and involved matter which requires a disciplined attention. Aside from these, there is no reason why it might not be begun with the freshman year.

Metallurgy is a second year study, because its consideration demands a good acquaintance with general chemical laws, and these are acquired during the first year.

Surgery is a third year study, because it demands not only a complete knowledge of anatomy, but a trained hand and absorbed attention as well. The student should begin the study of surgical pathology in the second year, and it may perhaps form a part of his general pathological studies.

Pathology should be differentiated from operative dentistry. They have very little in common, save that each may be curative. But operative dentistry is wholly mechanical and manipulative, while pathology should cover all medicinal and general treatment. Operative dentistry is largely prophylactic, while pathology is so to but a slight degree. Whatever has to do with the action of

drugs, whether generally or topically applied, belongs to pathological practice. In the treatment of alveolar abscess, for instance, operative dentistry has very little part, its practice being confined to that which is mechanical, or that which is done with instruments. I believe that in the past we have not sufficiently distinguished between the two. A sharp line of demarkation should be drawn between that which is mechanical and that which is therapeutical.

It will be seen that I have not attempted to assign any place to the practical part of dentistry. My subject was the teaching of anatomy, but I have thought it not inappropriate to suggest some thought concerning other didactic studies.

Let me repeat that I have only considered the matter tentatively, and realize as fully as any of you that there is room for much consideration and extended discussion before the various studies in our curriculum shall each have been definitely assigned its appropriate place.

WHERE IGNORANCE WAS NOT BLISS.

By MALCOLM W. SPARROW, L.D.S., Toronto.

While reading Dr. Martin's article on "Popular Dental Education," in the May number of your valuable journal, I was convinced of the truth there is in his reference to the ignorance of medical men—not all—who pretend—or shall I say, presume—to diagnose troubles which pertain strictly to the science of dentistry. Not only this, but the readiness with which some M.D.'s undertake the treatment of cases that are entirely out of their sphere—such as the extracting of troublesome teeth, the treatment of alveolar abscesses, *et cetera*, or by telling their patients hobgoblin stories about some maxillary trouble or another, which they do not themselves understand, nor have been taught to understand, thereby rendering it almost impossible for a dentist to remove from the patient's mind the fallacy of the M.D.'s diagnosis—is indeed provoking.

It seems to me that a medical man, without the degree of L.D.S. or D.D.S., ought not to prescribe for a patient suffering from derangement of the masticating organs—unless for temporary relief—any more than a dentist, without the degree of M.D., should prescribe for a patient suffering from a derangement of the digestive organs. It is no more than right that we should be fair with one another at all times. Some medical men, however, will grab at anything which promises a fee, and if the patient suffers through their ignorance of dental science, *messieurs les docteurs* try to justify

themselves by declaring the case a most remarkable one, and continuing experimental treatment until some friend of the patient advises him or her to consult a dentist, usually at a time when it is "too late to mend." The medical profession should be a *corps d'honneur* as well as a *corps de gendarmerie*.

All this leads up to a case I have at present, which the result of the M.D.'s ignorance has proven so serious to the patient that I feel justified in my "righteous indignation."

One day, some two years ago, a young woman whom I had often seen in the hotel at which I dine, came into the dining room with a badly swollen face. Being on speaking terms, I made some jocose remark about the pleasures of toothache, when she informed me, with a satisfaction that piqued my vanity, that Dr. ——— (a distinguished M.D.) was treating her. Being somewhat sensitive, and remembering certain rules of professional etiquette, I said no more. Three days later I was dining at the same hotel, with Dr. ——— (the aforesaid M.D.) sitting opposite, when I walked the young woman, with her face so badly swollen that her right eye was almost closed. As she remained out of hearing, I ventured to broach the subject to her physician.

"You are treating Miss ———?" said I.

This may have been cheeky of me, but I felt that I knew Dr. ——— well enough to make the query. I may add that the doctor was a practitioner of some twenty years' experience.

"Yes," said he. "It is a very bad case."

"What do you think it is?" said I, growing bolder, and at the same time wondering if the trouble could be some complication of which I was ignorant.

"Well, hem—ah—it is something out of the usual order," said he, with an air of great intelligence.

"Abscess of the antrum?" I ventured.

Now, I do not think I was presumptuous in making this venture, because I believe any dentist would have ventured the same remark, and with considerable less diffidence, perhaps.

"Oh no; oh, no. Nothing of the kind," said the wise M.D., with great assurance, and not a little hauteur, "it is something very extraordinary; very extraordinary, indeed."

I resumed my soup with a feeling that I had been sat upon.

The patient disappeared. Her physician, however, continued to take his meals, *sans souci*, at the same table with me, and having been sat upon once, I was very careful not to place myself in a position to be sat upon again, therefore our loquacity was exercised over everything but the girl with the swollen face. The next I heard of her she was in the hospital.

Several months afterwards, she came to me to consult about the

possibilities of an artificial denture. The condition of her mouth was appalling. From the left central to the right wisdom, the teeth and the alveolus were gone. The soft tissues were in a very angry condition, and there was a most obnoxious discharge of pus. Just then an artificial denture was out of the question. As she was under the physician's care, I told her to continue his treatment until the mouth was in a proper condition, then I would, if she desired, see what could be done for her. I saw her several times, at rather lengthy intervals, but it was not until a few days ago that I was enabled to take an impression. The brief history of the case is as follows:

1. An ulcerated superior right six-year molar, which was neglected until face began to swell.

2. The learned M.D.'s wonderful diagnosis and experimental treatment.

3. Abscess of the antrum, with all its pain and offensiveness.

4. A change of physicians (this man understood the case, but it was too late), followed by several weeks in the hospital, excruciating suffering, loss of teeth from superior left central to superior right wisdom, with continued suffering.

5. Necrosis of alveolus from central to wisdom, which came away in three pieces. I have in my possession one piece of bone which embraces the socket of the right central, lateral, canine, and first bicuspid. I have also a model of the mouth as it is at present.

Last, but by no means least, one year and a half of treatment and waiting, to say nothing of the annoyance and inconvenience before the wound healed. During this time the patient was at home, some distance from the city, under the treatment of her physician.

The wound is now healed, with the floor of the antrum gone, and a fissure opening through the soft tissue, which permits air and fluids to pass through the nose from the mouth. How I am to succeed with an artificial denture is a problem which just now appears to be something akin to a Chinese puzzle.

This whole trouble, I think, can safely be attributed to the ignorance of the M.D., who was so wondrous wise in his diagnosis. With this example before me, I can heartily coincide with Dr. Martin's statement:

"There are many notable exceptions among the medical profession, but we fear by far the greater majority are sadly, culpably ignorant of the simplest principles of dental conservation."

Proceedings of Dental Societies.

"LONDON DENTAL SOCIETY."

This society was formed in April last, to meet during the winter months, and has an enrolled membership of fifteen practitioners, as well as the students of respective members.

Dr. L. McDonald is the enthusiastic president, and shows the same interest as when curling the stone and "sooping her up."

Dr. H. R. Abbott exhibits for vice-president the same amount of energy as when riding his favorite hunter.

Dr. Fred. L. Wood, for secretary and treasurer, with the following: Drs. C. Abbott, Smith, Swann, Woolverton, Bentley, Harvey, J. A. Wood, Ziegler, Davis, Rea, Davidson and Holmes, as members.

The first meeting, held Saturday, Nov. 7th, at Dr. Davis' parlors was given over entirely to forming by-laws, constitution, and code of ethics to govern the society.

The second meeting was held on Saturday, Dec. 5th, same place, and was indeed one of great profit and benefit to all present.

Dr. Davis was nominated as a candidate for the Dental Board and we are pleased to note that he has been elected to fill the position. A more capable or energetic member of that Board could not be found, and we congratulate him on his success in attaining the appointment.

The Programme Committee introduced Dr. Davis, and the genial Dr. read an essay, the subject of which, "The Choice of a Filling Material," showed thought and study, and provoked a pleasant discussion, which was heartily entered into by all present, the older members giving their experiences, which must prove of great benefit to the younger.

At our next regular meeting Dr. Harvey will be the essayist.

Question Drawer.

Edited by DR. R. E. SPARKS, M.D., D.D.S., L.D.S., Kingston, Ont.

QUESTIONS.

Q. 36.—What is the best method of bleaching a tooth, discolored after the use of arsenic? Is the discoloration likely to return? If so, why?

Q. 37.—How may we diagnose an abscess in the bifurcation of the roots of a molar?

Dominion Dental Journal

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A HINT TO THE ONTARIO SOCIETY.

At the meeting of the Dental Society of the State of New York last month, Dr. Crouse referred to the way in which at a meeting of the American Dental Association he tripped up the "famous" Dr. Sheffield, whom some of our advertising charlatans quote as "authority." "Old Dr. Sheffield came there with his credentials before I even knew who he was. I sat at the table with my book, and he came in. *Ahead of him had come a lot of his advertisements.* When I asked him if he was authority for those documents, he wanted to know where I got them. An intimate friend of his told me he said many times it was the most fatal thing to his happiness that ever happened. He went home and spoke of it afterwards as being the greatest rebuff he had ever met. I speak of this to show that laws are necessary. It is not enjoyable to hold a man off like that, so we made it a rule that delegates should come with a *clean record. It has done more in the last eighteen years to make local societies keep their membership clean than anything else.*"

The Ontario Society might have a book for the special purpose of collecting the obnoxious advertisements of the profession. It should be open for public inspection at the annual meeting.

THE PATRON FUNERAL.

The funeral of the "Patrons" has at last occurred in Toronto. For a time it appeared as if this body would become formidable in the Ontario Legislature. It set out to abolish the Government House, to reduce expenditure, secure for the municipalities their old control over official appointments, abolish railway passes, and make "free trade in dentistry." Some of our discreet friends had reason, perhaps, to fear the interference of this organization, but it is at last dead and done for, and has not left a savory record behind it. There are occasions when one may rejoice over a grave. This is one.

ETHICS.

IT is rather curious to find ethical members of the profession making mock excuses for the sins and peccadilloes of the quacks. One good friend of ours in Ontario reiterates the charge that we are too hard on them. *Sub rosa*, he has more contempt than pity for them, but he does not think it politic to express himself openly, yet he offers no alternative suggestion but the policy of letting things drift. Now, the profession would be under deep obligations to any one who would find a remedy for quackery and quack-imitation other than exposure and ostracism. Would our worthy friend suggest something more effective? He happens to live in a town, which, for the present, is not pre-empted by the professional sharper. We would be only too glad to adopt milder methods, if it can be shown from even one instance that the quack and the gutter-dentist can be converted from the error of their ways by mission efforts of a purely philanthropic and persuasive character. Experience has proven the value of the logic of exposure. Exposure of existing quackery has deterred some, too, from following in its footsteps.

GEOGRAPHY OF THE TEETH.

IN an interesting series of articles in the *Popular Science Monthly* on the racial geography of Europe, France, the Teuton and the Celt is discussed in the July issue, and mention made of facts in connection with the teeth, which was brought to our notice in 1875 by Dr. Ed. Lefavre, of Paris, formerly of Montreal. On the calcareous plains of central France the people are taller, of light complexion, with blue or grayish-blue eyes, and having fine teeth; while in the upland areas of a granitic formation, the

people were stunted, dark in complexion with very poor teeth. The former are a superior group, intellectually and morally as well as physically. During a prolonged pedestrian tour with our *confreres* in Brittany and Normandy, we were much struck with the difference in the physical types in favor of the latter. Normandy contains the blondest people of France, Brittany the darkest and most benighted. Even the cattle have marked differences which, with the contrasts in the human types, are attributed to the influences of physical environment. Progress and prosperity show their effects in superior physique. Normandy and good teeth; Brittany and bad teeth. Brittany is the most devout (superstitious). The native Breton peasants are the filthiest people in Europe.

Reviews.

The American Text-Book of Operative Dentistry. In contributions by eminent American authorities. Edited by EDWARD C. KIRK, D.D.S., Professor of Clinical Dentistry, University of Pennsylvania, Department of Dentistry. In one very handsome octavo volume of 699 pages, with 751 engravings. Cloth, \$5.50; leather, \$6.50; *net*. Lea Bros. & Co., publishers, Philadelphia and New York.

Dental literature, dental practitioners and dental students have all made a notable acquisition in this work. From a literary point of view it will add to the reputation of the profession, to the practising dentist it will furnish the latest and best information in the operative part of his work, and it will aid the student in mastering the art and profession of dentistry in the first place by the emphasis laid on the scientific principles, and secondly by the full treatment given to the descriptive data.

Of all the medical sciences dentistry has perhaps received the highest specialization. To present it completely in its ripest modern development is beyond the power of any one mind, hence the wisdom and necessity of invoking the knowledge possessed by recognized authorities in the various departments. The editor, Dr. Kirk, is intimately acquainted with the personnel of the dental profession, and he has secured the willing services of Drs. R. R. Andrews, H. H. Burchard, C. S. Case, W. E. Christensen, D. M. Clapp, M. H. Cryer, E. T. Darby, C. L. Goddard, L. H. Guilford, Louis Jack, L. Ottofy, C. N. Peirce, J. D. Thomas, and A. H. Thompson, to whose admirable chapters he has added one from his own experience.

The work is essentially a new departure; old traditions have

been subjected to critical study and rejected when found obsolete, or restated when their value was evident. The plan followed has resulted in a practical exposition of all that may be fairly included under the title, so arranged and presented as to meet the requirements of those for whom it was written. The statements made are either those of verified fact or are based on deductions warranted by existing knowledge. Ample use has been made of pictures, the series including no less than 750 engravings illustrative of the present status of the science and art of operative dentistry.

In this volume and its companion, "The American Text-book of Prosthetic Dentistry," edited by Professor Essig, it may be reasonably said that dental students and practitioners have a clear, comprehensive and sufficiently complete statement of the two great departments of their profession, representing its present advanced status in the country to which it chiefly owes its development.

SIX CALCULI IN STENO'S DUCT IN A CHILD OF THIRTEEN YEARS.—Dr. Deuer, in *Jour. de Clinig. et de Therap. inf.* (No. 16, p. 317, 1897) reviews this case from *La. Pres. Med. Belg.*: The child complained of slight difficulty in mastication, pains in the right jaw and intermittent swelling, principally in cold and damp weather. Symptoms began three years ago. There was no dryness of the mouth. Hard bodies were felt in the duct. The probe took the course of a dipping curve through the duct but failed to reach the stones. Incision was made along the anterior margin of the masseter, and the six concretions were removed from a pouch in the duct, weighing 1-15 grn. to 2 grn. each. De Closmadeuc (in 1855), out of 132 salivary calculi, found only 11 in Steno's duct.—*Amer. Med. Surg. Bulletin*, July, 25th, 1897.

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